

Assignment 2 : Q3: Report

Question 3 *Denoising Magnetic Resonance Image of the Brain*

Part a


Noise Standard Deviation for Real Part : 0.0609

Noise Standard Deviation for Imaginary Part : 0.05809

So Noise is complex gaussian noise with standard deviation: 0.0841

Part b

Corresponding images for Different Type of Prior

Description	Specific
Noisy	<p>Noisy Image for Brain</p> 

Quadratic Prior

Optimal Image of Denoised Brain for quadratic prior



Huber Prior

Optimal Image of Denoised Brain for huber prior



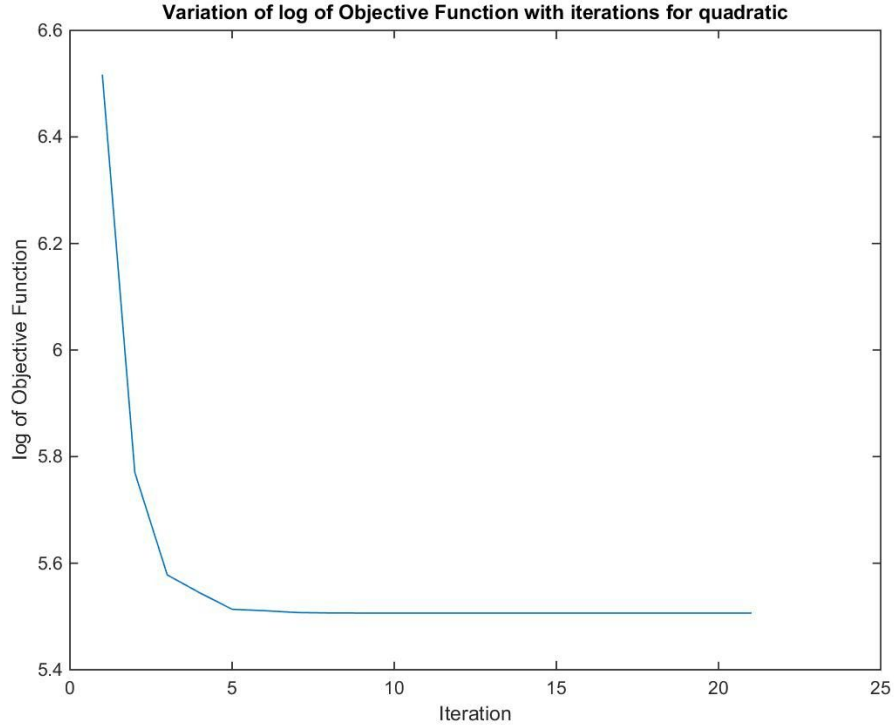
Discontinuity adaptive
function Prior

Optimal Image of Denoised Brain for $\text{disc}_a \text{dapt}_f$ function prior

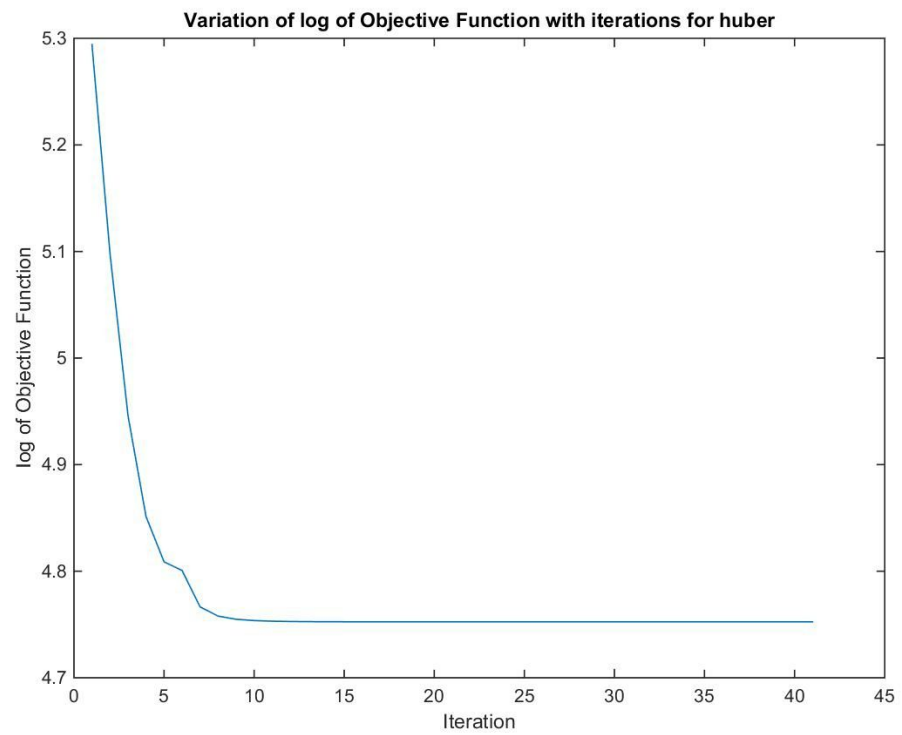


Part c

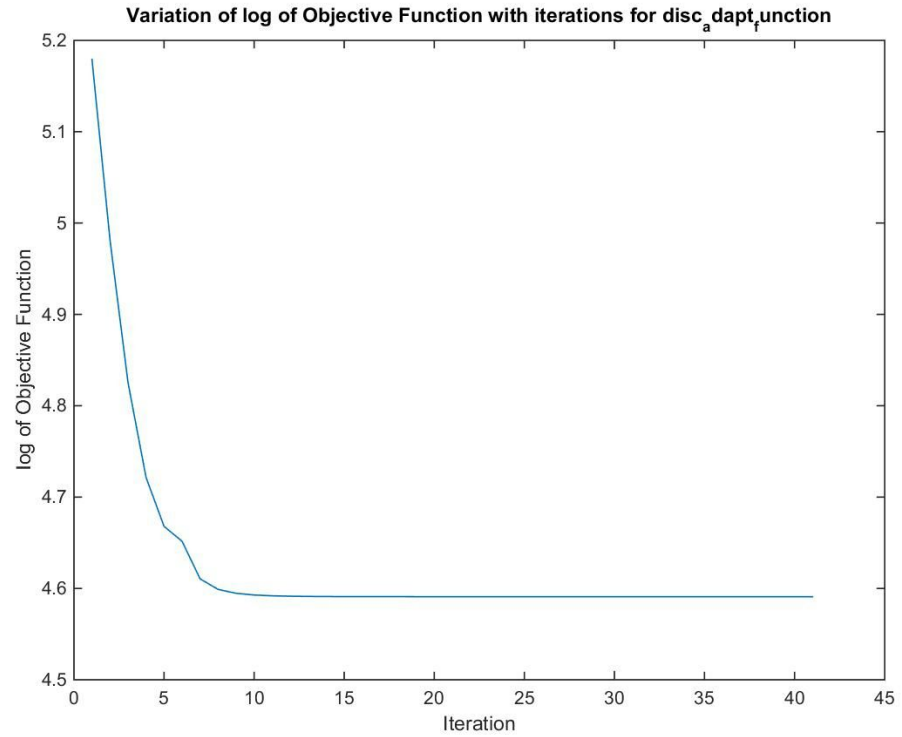
Corresponding plots of Objective Function for Different Type of Prior

Prior Type	Plot of log of Objective Function																																												
Quadratic	 <p>Variation of log of Objective Function with iterations for quadratic</p> <table border="1"><thead><tr><th>Iteration</th><th>log of Objective Function</th></tr></thead><tbody><tr><td>1</td><td>6.52</td></tr><tr><td>2</td><td>5.78</td></tr><tr><td>3</td><td>5.58</td></tr><tr><td>4</td><td>5.54</td></tr><tr><td>5</td><td>5.51</td></tr><tr><td>6</td><td>5.51</td></tr><tr><td>7</td><td>5.51</td></tr><tr><td>8</td><td>5.51</td></tr><tr><td>9</td><td>5.51</td></tr><tr><td>10</td><td>5.51</td></tr><tr><td>11</td><td>5.51</td></tr><tr><td>12</td><td>5.51</td></tr><tr><td>13</td><td>5.51</td></tr><tr><td>14</td><td>5.51</td></tr><tr><td>15</td><td>5.51</td></tr><tr><td>16</td><td>5.51</td></tr><tr><td>17</td><td>5.51</td></tr><tr><td>18</td><td>5.51</td></tr><tr><td>19</td><td>5.51</td></tr><tr><td>20</td><td>5.51</td></tr><tr><td>21</td><td>5.51</td></tr></tbody></table>	Iteration	log of Objective Function	1	6.52	2	5.78	3	5.58	4	5.54	5	5.51	6	5.51	7	5.51	8	5.51	9	5.51	10	5.51	11	5.51	12	5.51	13	5.51	14	5.51	15	5.51	16	5.51	17	5.51	18	5.51	19	5.51	20	5.51	21	5.51
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Huber



Discontinuity-Adaptive Huber Prior



Disclaimer

All the images and corresponding plots in high resolution can be found in 'images' folder of question 2. Sub folder are made for different priors and you can locate optimal images and objective function plot.